

To: Ralph.Iovinelli@faa.gov[Ralph.Iovinelli@faa.gov]
Cc: Audette, Lucie[audette.lucie@epa.gov]; Yen, David[Yen.David@epa.gov]; Leggett, Cullen[Leggett.Cullen@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]
From: Manning, Bryan
Sent: Mon 11/23/2015 3:38:19 PM
Subject: RE: US IP on EPA aircraft GHG endangerment/ANPR (for CAEP10)
CAEP 10 IP 26 Update on US Aircraft GHG Rulemaking Process AVedits2 - LM 23 Nov+RI+BM.docx

Ex. 5 - Deliberative Process

Thanks again,

Bryan

Bryan Manning

U.S. EPA Office of Transportation and Air Quality

Large Marine and Aviation Center

2000 Traverwood Drive

Ann Arbor, MI 48105

(ph) 734-214-4832 (fax) 734-214-4816

manning.bryan@epa.gov

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Monday, November 23, 2015 9:27 AM
To: Manning, Bryan <manning.bryan@epa.gov>
Cc: Audette, Lucie <audette.lucie@epa.gov>; Yen, David <Yen.David@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: RE: US IP on EPA aircraft GHG endangerment/ANPR (for CAEP10)

Hi Bryan,

Attached are very minor edits to the IP --- with a clarification needed in para 2.3. Please let us know how you want to address at your earliest convenience.

Thanks,

Ralph

From: Manning, Bryan [<mailto:manning.bryan@epa.gov>]

Sent: Monday, November 16, 2015 11:29 AM

To: Iovinelli, Ralph (FAA)

Cc: Audette, Lucie; Yen, David; Leggett, Cullen; Samulski, Michael; Scata, Donald (FAA); Maurice, Lourdes (FAA)

Subject: US IP on EPA aircraft GHG endangerment/ANPR (for CAEP10)

Hello Ralph,

Attached please find the slightly updated (from previous SG meetings) US Information Paper on the aircraft GHG endangerment/ANPR for CAEP10. We just inserted some very minor updates in paragraphs 1.1 and 2.4. Let me know if you have any comments.

Thank you,

Bryan

Bryan Manning

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Large Marine and Aviation Center

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Ann Arbor, MI 48105

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manning.bryan@epa.gov

To: Manning, Bryan[manning.bryan@epa.gov]
Cc: Audette, Lucie[audette.lucie@epa.gov]; Yen, David[Yen.David@epa.gov]; Leggett, Cullen[Leggett.Cullen@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]
From: Ralph.lovinelli@faa.gov
Sent: Mon 11/23/2015 2:27:17 PM
Subject: RE: US IP on EPA aircraft GHG endangerment/ANPR (for CAEP10)
CAEP 10 IP 26 Update on US Aircraft GHG Rulemaking Process AVedits2 - LM 23 Nov+RI.docx

Hi Bryan,

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From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Monday, November 16, 2015 11:29 AM
To: lovinelli, Ralph (FAA)
Cc: Audette, Lucie; Yen, David; Leggett, Cullen; Samulski, Michael; Scata, Donald (FAA); Maurice, Lourdes (FAA)
Subject: US IP on EPA aircraft GHG endangerment/ANPR (for CAEP10)

Hello Ralph,

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Thank you,

Bryan

Bryan Manning

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2000 Traverwood Drive

Ann Arbor, MI 48105

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manning.bryan@epa.gov

To: dedoussi@mit.edu[dedoussi@mit.edu]; byutko@MIT.EDU[byutko@MIT.EDU]; Laszlo.Windhoffer@faa.gov[Laszlo.Windhoffer@faa.gov];
Ralph.Iovinelli@faa.gov[Ralph.Iovinelli@faa.gov]; maryalice.locke@faa.gov[maryalice.locke@faa.gov];
James.Hileman@faa.gov[James.Hileman@faa.gov]; morrisab@mit.edu[morrisab@mit.edu];
pwolfe@mit.edu[pwolfe@mit.edu]; aashok@mit.edu[aashok@mit.edu]; rjhans@mit.edu[rjhans@mit.edu];
Sarofim, Marcus[Sarofim.Marcus@epa.gov]; Jantarasami, Lesley[Jantarasami.Lesley@epa.gov];
Davidson, Ken[Davidson.Ken@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]; McGartland,
Al[McGartland.Al@epa.gov]; Rennert, Kevin[Rennert.Kevin@epa.gov]; Marten,
Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Wolverton,
Ann[Wolverton.Ann@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Leggett,
Cullen[Leggett.Cullen@epa.gov]; Yen, David[Yen.David@epa.gov]; Kopits,
Elizabeth[Kopits.Elizabeth@epa.gov]
From: Manning, Bryan
Sent: Wed 11/18/2015 10:51:58 PM
Subject: EPA comments on FAA/MIT cost-benefit analysis (two draft US info papers for CAEP/10)
[EPA Technical comments on FAA CO2 informational CBA 11-18-15.docx](#)
[CAEP.10.IP.Agenda Item.05.en GLOBAL-20151109.docx](#)
[CAEP.10.IP.Agenda Item.05.en US-20151109.docx](#)

Hello Ralph and Laszlo,

Ex. 5 - Deliberative Process

We look forward to talking with you at 1:00 pm eastern tomorrow on the call. In the meantime, let us know if you have any questions.

Thank you,

Bryan

Bryan Manning

U.S. EPA Office of Transportation and Air Quality

Large Marine and Aviation Center

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Ann Arbor, MI 48105

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manning.bryan@epa.gov

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 11/9/2015 11:33:33 PM
To: Manning, Bryan [manning.bryan@epa.gov]; Leggett, Cullen [Leggett.Cullen@epa.gov]; Samulski, Michael [samulski.michael@epa.gov]
CC: Ralph.Iovinelli@faa.gov
Subject: CO2 Standard Cost-Benefit Analyses (EPA Review)
Attachments: CAEP.10.IP.Agenda Item.05.en_US-20151109.docx; CAEP.10.IP.Agenda Item.05.en_GLOBAL-20151109.docx

Importance: High

Dear Mike, Bryan, Cullen,

For your review, attached are the Global and US-only cost-benefit analyses of the CO₂ standard. The documents are in information paper format for the upcoming CAEP/10 meeting. Please share with your EPA colleagues who can also provide feedback.

Please note that while the documents have gone through a number of rounds of review, and although they are now ready to be shared with you, they are not final. These versions are undergoing further reviews by FAA.

Although the papers are long, if at all possible I would **appreciate your feedback within the next 2 weeks (by latest Friday Nov 20)**. This would leave approximately 2-3 weeks (prior to the 12/4 deadline) in order to address any comments you may have, and potentially allow for another short review.

Looking forward to your feedback.

Thank you

*Laszlo Windhoffer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, S.W.
Washington, DC 20591
T +1-202-267-4741*

To: Lourdes.Maurice@faa.gov[Lourdes.Maurice@faa.gov]; Leggett, Cullen[Leggett.Cullen@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]
Cc: Manning, Bryan[manning.bryan@epa.gov]; Ralph.Iovinelli@faa.gov[Ralph.Iovinelli@faa.gov]; maryalice.locke@faa.gov[maryalice.locke@faa.gov]
From: Laszlo.Windhoffer@faa.gov
Sent: Tue 12/22/2015 6:27:28 PM
Subject: RE: RIA edits - Take 2
Information to support rulemaking of ICAO Member States_Draftv4_clean+US.docx

Hi Lourdes et al,

While awaiting any further comments, I went through the entire document and manually re-added all the actual edits we're going with, and anonymized them; this is attached. This also seemed to fix a lot of the formatting issues and will hopefully help out Chris/others.

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Re level of detail, even with this level of detail, I think the average person may have trouble understanding this; but I see your point. Below is a draft email to Chris et al. Unless there are any further comments, I'm happy to send this along with the attachment.

Thoughts?

Dear Chris et al,

Thanks for your patience with this. Please find attached a some edits and comments from the US team. The aim of these comments is simply to help clarify the text.

Ex. 5 - Deliberative Process

Thanks again.

PS: As a result of the edits, a couple areas may need adjustment in terms of formatting and figure/table labeling.

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

From: Maurice, Lourdes (FAA)
Sent: Tuesday, December 22, 2015 8:26 AM
To: Windhoffer, Laszlo (FAA); Leggett, Cullen; Samulski, Michael
Cc: Manning, Bryan; Iovinelli, Ralph (FAA); Locke, Maryalice (FAA)
Subject: RE: RIA edits - Take 2

Thanks very much This was much easier to review

I have a few tweaks in the attached.

Ex. 5 - Deliberative Process

I am very concerned about the level of detail and the SO discussion.

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

I would appreciate if this point was made in the transmittal. We will do our best to contribute to preparing this text – but we may not approve it at CAEP/10. Don't want any surprises.

Who will transmit the document after my questions addressed and anyone else comments?
Cheers Lourdes

From: Windhoffer, Laszlo (FAA)
Sent: Monday, December 21, 2015 11:28 PM
To: Leggett, Cullen; Maurice, Lourdes (FAA); Samulski, Michael
Cc: Manning, Bryan; Iovinelli, Ralph (FAA); Locke, Maryalice (FAA)
Subject: RE: RIA edits - Take 2

All,

If it helps, here is an updated version in which I only kept the tracked changes Cullen and I decided to keep (Cullen please check if you can). If we decide to not include section 10, then we would be ~5 pages longer than Chris' last draft.

Note that there are some formatting issues as a result of the changes, we'd need to fix tomorrow or otherwise let Chris know to take the edits onboard in his version.

Let us know your thoughts, if possible by tomorrow.

Thanks!

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

From: Leggett, Cullen [<mailto:Leggett.Cullen@epa.gov>]
Sent: Monday, December 21, 2015 5:17 PM
To: Maurice, Lourdes (FAA) <Lourdes.Maurice@faa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>
Subject: RIA edits - Take 2

Here are the edits from Laszlo and myself.

Let us know if you have any additional comments or edits.

To: Laszlo.Windhoffer@faa.gov[Laszlo.Windhoffer@faa.gov]; Leggett, Cullen[Leggett.Cullen@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]
Cc: Manning, Bryan[manning.bryan@epa.gov]; Ralph.Ivinelli@faa.gov[Ralph.Ivinelli@faa.gov]; maryalice.locke@faa.gov[maryalice.locke@faa.gov]
From: Lourdes.Maurice@faa.gov
Sent: Tue 12/22/2015 1:26:23 PM
Subject: RE: RIA edits - Take 2
Information to support rulemaking of ICAO Member States_Draftv4_clean+US + LM 22 Dec.docx

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Ex. 5 - Deliberative Process

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Sent: Monday, December 21, 2015 11:28 PM
To: Leggett, Cullen; Maurice, Lourdes (FAA); Samulski, Michael
Cc: Manning, Bryan; Iovinelli, Ralph (FAA); Locke, Maryalice (FAA)
Subject: RE: RIA edits - Take 2

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Sent: Monday, December 21, 2015 5:17 PM
To: Maurice, Lourdes (FAA) <Lourdes.Maurice@faa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>

Subject: RIA edits - Take 2

Here are the edits from Laszlo and myself.

Let us know if you have any additional comments or edits.

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 12/22/2015 4:27:33 AM
To: Leggett, Cullen [Leggett.Cullen@epa.gov]; Lourdes.Maurice@faa.gov; Samulski, Michael [samulski.michael@epa.gov]
CC: Manning, Bryan [manning.bryan@epa.gov]; Ralph.Iovinelli@faa.gov; maryalice.locke@faa.gov
Subject: RE: RIA edits - Take 2
Attachments: Information to support rulemaking of ICAO Member States_Draftv4_clean+US.docx

All,

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Let us know your thoughts, if possible by tomorrow.

Thanks!

*Laszlo Windhoffer
Federal Aviation Administration
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From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: Monday, December 21, 2015 5:17 PM
To: Maurice, Lourdes (FAA) <Lourdes.Maurice@faa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>
Subject: RIA edits - Take 2

Here are the edits from Laszlo and myself.

Let us know if you have any additional comments or edits.

To: Manning, Bryan[manning.bryan@epa.gov];
 maryalice.locke@faa.gov[maryalice.locke@faa.gov]; Ralph.Iovinelli@faa.gov[Ralph.Iovinelli@faa.gov];
 dedoussi@mit.edu[dedoussi@mit.edu]; byutko@mit.edu[byutko@mit.edu];
 James.Hileman@faa.gov[James.Hileman@faa.gov]; morrisab@mit.edu[morrisab@mit.edu];
 pwolfe@mit.edu[pwolfe@mit.edu]; aashok@mit.edu[aashok@mit.edu]; rjhans@mit.edu[rjhans@mit.edu];
 Sarofim, Marcus[Sarofim.Marcus@epa.gov]; Jantarasami, Lesley[Jantarasami.Lesley@epa.gov];
 Davidson, Ken[Davidson.Ken@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]; McGartland,
 Al[McGartland.Al@epa.gov]; Rennert, Kevin[Rennert.Kevin@epa.gov]; Marten,
 Alex[Marten.Alex@epa.gov]; Griffiths, Charles[Griffiths.Charles@epa.gov]; Wolverton,
 Ann[Wolverton.Ann@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Leggett,
 Cullen[Leggett.Cullen@epa.gov]; Yen, David[Yen.David@epa.gov]; Kopits,
 Elizabeth[Kopits.Elizabeth@epa.gov]
From: Laszlo.Windhoffer@faa.gov
Sent: Thur 12/3/2015 4:34:02 PM
Subject: RE: Final ICAO CAEP CO2 CBA IPs
[CAEP.10.IP.Agenda Item.05.en US-20151203 redline.docx](#)
[CAEP.10.IP.Agenda Item.05.en GLOBAL-20151203 redline.docx](#)

Redline versions.

László Windhoffer

*Federal Aviation Administration
 T: +1-202-267-4741*

From: Windhoffer, Laszlo (FAA)
Sent: Thursday, December 3, 2015 11:32 AM
To: 'Manning, Bryan' <manning.bryan@epa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>;
 'dedoussi@mit.edu' <dedoussi@mit.edu>; Yutko, Brian (AEDT) <byutko@mit.edu>; Hileman,
 James (FAA) <James.Hileman@faa.gov>; 'morrisab@mit.edu' <morrisab@mit.edu>;
 'pwolfe@mit.edu' <pwolfe@mit.edu>; 'aashok@mit.edu' <aashok@mit.edu>; rjhans
 <rjhans@mit.edu>; 'Sarofim, Marcus' <Sarofim.Marcus@epa.gov>; 'Jantarasami, Lesley'
 <Jantarasami.Lesley@epa.gov>; 'Davidson, Ken' <Davidson.Ken@epa.gov>; 'Samulski,
 Michael' <samulski.michael@epa.gov>; 'McGartland, Al' <McGartland.Al@epa.gov>; 'Rennert,
 Kevin' <Rennert.Kevin@epa.gov>; 'Marten, Alex' <Marten.Alex@epa.gov>; 'Griffiths, Charles'
 <Griffiths.Charles@epa.gov>; 'Wolverton, Ann' <Wolverton.Ann@epa.gov>; 'Shouse, Kate'
 <Shouse.Kate@epa.gov>; 'Leggett, Cullen' <Leggett.Cullen@epa.gov>; 'Yen, David'
 <Yen.David@epa.gov>; 'Kopits, Elizabeth' <Kopits.Elizabeth@epa.gov>
Subject: Final ICAO CAEP CO2 CBA IPs

Dear all,

Attached are the final papers. Redline versions to follow.

Thank you again for your support!

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

From: Windhoffer, Laszlo (FAA)
Sent: Thursday, December 3, 2015 9:07 AM
To: 'Manning, Bryan' <manning.bryan@epa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; dedoussi@mit.edu; Yutko, Brian (AEDT) <byutko@mit.edu>; Hileman, James (FAA) <James.Hileman@faa.gov>; morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans <rjhans@mit.edu>; Sarofim, Marcus <Sarofim.Marcus@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Marten, Alex <Marten.Alex@epa.gov>; Griffiths, Charles <Griffiths.Charles@epa.gov>; Wolverton, Ann <Wolverton.Ann@epa.gov>; Shouse, Kate <Shouse.Kate@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Kopits, Elizabeth <Kopits.Elizabeth@epa.gov>
Subject: RE: ACTION re: EPA Comments - Final Review: ICAO CAEP CO2 CBA IPs

Hi Bryan,

Yes that will be the final paragraph. We will shortly circulate the final redline and clean versions.

Thank you all for your time to review this paper!

László Windhoffer

Federal Aviation Administration
T: +1-202-267-4741

From: Manning, Bryan [<mailto:manning.bryan@epa.gov>]
Sent: Thursday, December 3, 2015 9:00 AM
To: Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; dedoussi@mit.edu; Yutko, Brian (AEDT) <byutko@mit.edu>; Hileman, James (FAA) <James.Hileman@faa.gov>; morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans@mit.edu; Sarofim, Marcus <Sarofim.Marcus@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Marten, Alex <Marten.Alex@epa.gov>; Griffiths, Charles <Griffiths.Charles@epa.gov>; Wolverton, Ann <Wolverton.Ann@epa.gov>; Shouse, Kate <Shouse.Kate@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Kopits, Elizabeth <Kopits.Elizabeth@epa.gov>
Subject: RE: ACTION re: EPA Comments - Final Review: ICAO CAEP CO2 CBA IPs

Ex. 5 - Deliberative Process

We appreciate all of FAA/MIT's efforts in working through our comments on the two IPs.

Thanks again,

Bryan

Bryan Manning

U.S. EPA Office of Transportation and Air Quality

Large Marine and Aviation Center

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Ann Arbor, MI 48105

(ph) 734-214-4832 (fax) 734-214-4816

manning.bryan@epa.gov

From: maryalice.locke@faa.gov [mailto:maryalice.locke@faa.gov]

Sent: Wednesday, December 02, 2015 5:35 PM

To: Manning, Bryan <manning.bryan@epa.gov>; Laszlo.Windhoffer@faa.gov;
Ralph.Iovinelli@faa.gov; dedoussi@mit.edu; byutko@mit.edu;
James.Hileman@faa.gov; morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu;
rjhans@mit.edu; Sarofim, Marcus <Sarofim.Marcus@epa.gov>; Jantarasami, Lesley
<Jantarasami.Lesley@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Samulski,
Michael <samulski.michael@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>;
Rennert, Kevin <Rennert.Kevin@epa.gov>; Marten, Alex <Marten.Alex@epa.gov>;
Griffiths, Charles <Griffiths.Charles@epa.gov>; Wolverton, Ann
<Wolverton.Ann@epa.gov>; Shouse, Kate <Shouse.Kate@epa.gov>; Leggett, Cullen
<Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Kopits, Elizabeth
<Kopits.Elizabeth@epa.gov>

Subject: RE: ACTION re: EPA Comments - Final Review: ICAO CAEP CO2 CBA IPs

I just noticed an extra "and" that should also be deleted, which is highlighted in blue below

Bryan et al,

Ex. 5 - Deliberative Process

Please review yellow highlighted changes regarding same and let us know if these are acceptable.

Ex. 5 - Deliberative Process

Thanks,

Maryalice Locke

Aviation Emissions Division, AEE-300

Office of Environment and Energy

U.S. Federal Aviation Administration

800 Independence Avenue SW, Washington DC 20591

Phone: 202-267-3495

Email: Maryalice.Locke@FAA.gov

From: Manning, Bryan [<mailto:manning.bryan@epa.gov>]

Sent: Wednesday, December 02, 2015 3:39 PM

To: Windhoffer, Laszlo (FAA); Iovinelli, Ralph (FAA); dedoussi@mit.edu; Yutko, Brian (AEDT); Locke,

Maryalice (FAA); Hileman, James (FAA); morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans; Sarofim, Marcus; Jantarasami, Lesley; Davidson, Ken; Samulski, Michael; McGartland, Al; Rennert, Kevin; Marten, Alex; Griffiths, Charles; Wolverton, Ann; Shouse, Kate; Leggett, Cullen; Yen, David; Kopits, Elizabeth

Subject: EPA COMMENTS - Final Review: ICAO CAEP CO2 CBA IPs

Hello Laszlo,

Below are EPA's full set of comments on the latest versions of these CBA IPs. For the sake of time, I am just providing these comments in this email. Let me know if you need me to insert redline/strikeout out text into the two IPs.

*****COMMENTS*****

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

*****END of COMMENTS*****

Let us know if you have any questions.

Thank you,

Bryan

Bryan Manning

U.S. EPA Office of Transportation and Air Quality

Large Marine and Aviation Center

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Ann Arbor, MI 48105

(ph) 734-214-4832 (fax) 734-214-4816

manning.bryan@epa.gov

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]

Sent: Tuesday, December 01, 2015 2:17 PM

To: Manning, Bryan <manning.bryan@epa.gov>; Ralph.lovinelli@faa.gov; dedoussi@mit.edu; byutko@mit.edu; maryalice.locke@faa.gov; James.Hileman@faa.gov; morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans@mit.edu; Sarofim, Marcus <Sarofim.Marcus@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Marten, Alex <Marten.Alex@epa.gov>; Griffiths, Charles <Griffiths.Charles@epa.gov>; Wolverton, Ann <Wolverton.Ann@epa.gov>; Shouse, Kate <Shouse.Kate@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Kopits, Elizabeth <Kopits.Elizabeth@epa.gov>

Subject: Final Review: ICAO CAEP CO2 CBA IPs

Importance: High

Dear All,

As promised, attached are the updated versions of the global and US CO2 cost-benefit information papers that are intended for the upcoming CAEP/10 meeting.

Please note: as most edits were tentatively agreed during yesterday's telecon, and for clarity of what outstanding feedback required changes as of yesterday, these versions of the papers only show changes made to the papers since yesterday's versions.

Once again, it would be of great help if you could **please provide any final feedback by close of business tomorrow, Dec 2.**

Thank you

PS: There are still some misaligned tables, apologizes they're due to Windows vs Mac incompatibilities that are being fixed. Meanwhile I will follow-up this email with clean PDF versions that do not have this issue.

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

From: Windhoffer, Laszlo (FAA)
Sent: Monday, November 30, 2015 5:33 PM
To: 'Manning, Bryan' <manning.bryan@epa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; dedoussi@mit.edu; Yutko, Brian (AEDT) <byutko@mit.edu>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Hileman, James (FAA) <James.Hileman@faa.gov>; morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans <rjhans@mit.edu>; Sarofim, Marcus <Sarofim.Marcus@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; McGartland, Al <McGartland.Al@epa.gov>; Rennert, Kevin <Rennert.Kevin@epa.gov>; Marten, Alex <Marten.Alex@epa.gov>; Griffiths, Charles <Griffiths.Charles@epa.gov>; Wolverton, Ann <Wolverton.Ann@epa.gov>; Shouse, Kate <Shouse.Kate@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Kopits, Elizabeth (Kopits.Elizabeth@epa.gov) <Kopits.Elizabeth@epa.gov>
Subject: RE: Review of CBA IPs
Importance: High

Dear All,

Based on your feedback today, the few changes are being implemented. Please keep your eyes out for revised redline and clean versions arriving in your inboxes at some point tomorrow. We will try to get it in your hands as early as possible. I would like to ask for your **final review by close of business on Wednesday Dec 2.**

(Meanwhile you can review the versions circulated today.)

Thank you for your time today, we are very close!

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

From: Windhoffer, Laszlo (FAA)

Sent: Monday, November 30, 2015 1:08 PM

To: 'Manning, Bryan'; Iovinelli, Ralph (FAA); dedoussi@mit.edu; Yutko, Brian (AEDT); Locke, Maryalice (FAA); Hileman, James (FAA); morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans; Sarofim, Marcus; Jantarasami, Lesley; Davidson, Ken; Samulski, Michael; McGartland, Al; Rennert, Kevin; Marten, Alex; Griffiths, Charles; Wolverton, Ann; Shouse, Kate; Leggett, Cullen; Yen, David; Kopits, Elizabeth (Kopits.Elizabeth@epa.gov)

Subject: RE: Review of CBA IPs

Dear All,

With hard by MIT over the holiday, redline and clean versions of the IPs are now available for quick review prior to our discussion today at 3pm (Eastern).

Please find attached the redline and clean versions of the US IP.

Redline and clean versions of the global IP are coming in subsequent emails.

Thank you

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

-----Original Appointment-----

From: Windhoffer, Laszlo (FAA)

Sent: Friday, November 27, 2015 12:36 PM

To: Windhoffer, Laszlo (FAA); 'Manning, Bryan'; Iovinelli, Ralph (FAA); dedoussi@mit.edu; Yutko, Brian (AEDT); Locke, Maryalice (FAA); Hileman, James (FAA); morrisab@mit.edu; pwolfe@mit.edu; aashok@mit.edu; rjhans; Sarofim, Marcus; Jantarasami, Lesley; Davidson, Ken; Samulski, Michael; McGartland, Al; Rennert, Kevin; Marten, Alex; Griffiths, Charles; Wolverton, Ann; Shouse, Kate; Leggett, Cullen; Yen, David; Kopits, Elizabeth (Kopits.Elizabeth@epa.gov)

Subject: Review of CBA IPs

When: Monday, November 30, 2015 3:00 PM-4:30 PM (UTC-05:00) Eastern Time (US & Canada).

Where: See below for webex/telecon info.

Hi Everyone,

The intent of this call, on Monday 11/30 @ 3pm, is to review redline edits made to the CBA IPs since their 11/9 circulation. Both redline and clean versions will be circulated ahead of this call. This will be the last week to finalize the papers, therefore we need to aim to agree on all major concerns. Ideally we can do that, and thereby allowing the papers to be finalized during the call or shortly thereafter (i.e. the following day - Tuesday).

Thank you and speak to you on Monday.

Meeting number: Ex. 6 - Personal Privacy

Audio connection: Ex. 6 - Personal Privacy Call-in toll-free number: Ex. 6 - Personal Privacy
Call-in number

Conference Code: Ex. 6 - Personal Privacy

Meeting link:

<https://bahmeetings.webex.com/bahmeetings/j.php?MTID=m78bd81a8d70856b0a5d240b46690a857>

To: Manning, Bryan[manning.bryan@epa.gov]; Shouse, Kate[Shouse.Kate@epa.gov]; Jantarasami, Lesley[Jantarasami.Lesley@epa.gov]; Sarofim, Marcus[Sarofim.Marcus@epa.gov]
Cc: Samulski, Michael[samulski.michael@epa.gov]; Leggett, Cullen[Leggett.Cullen@epa.gov]; Maeroff, Bruce[Maeroff.Bruce@epa.gov]
From: Davidson, Ken
Sent: Wed 10/28/2015 7:16:33 PM
Subject: RE: Summary of issues with FAA/MIT cost-benefit analysis (ICAO aircraft CO2 standard) - PLEASE REVIEW

Hi Bryan,

See my edits to the health impacts bullet below. Thanks!

Ken

Kenneth Davidson

U.S. Environmental Protection Agency

Office of Transportation and Air Quality/Region 9 Air Division

75 Hawthorne St. (AIR-6)

San Francisco, CA 94105

Phone: 415-972-3633

FAX: 415-947-3583

From: Manning, Bryan
Sent: Wednesday, October 28, 2015 11:59 AM
To: Shouse, Kate <Shouse.Kate@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Sarofim, Marcus <Sarofim.Marcus@epa.gov>
Cc: Samulski, Michael <samulski.michael@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Maeroff, Bruce <Maeroff.Bruce@epa.gov>
Subject: RE: Summary of issues with FAA/MIT cost-benefit analysis (ICAO aircraft CO2 standard) - PLEASE REVIEW

Kate,

Ex. 5 - Deliberative Process

Thank you,

Bryan

Bryan Manning

U.S. EPA Office of Transportation and Air Quality

Large Marine and Aviation Center

2000 Traverwood Drive

Ann Arbor, MI 48105

(ph) 734-214-4832 (fax) 734-214-4816

manning.bryan@epa.gov

From: Shouse, Kate

Sent: Wednesday, October 28, 2015 2:52 PM

To: Manning, Bryan <manning.bryan@epa.gov>; Davidson, Ken <Davidson.Ken@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Sarofim, Marcus <Sarofim.Marcus@epa.gov>

Cc: Samulski, Michael <samulski.michael@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Maeroff, Bruce <Maeroff.Bruce@epa.gov>

Subject: RE: Summary of issues with FAA/MIT cost-benefit analysis (ICAO aircraft CO2 standard) - PLEASE REVIEW

Ex. 5 - Deliberative Process

Thanks,
Kate

From: Manning, Bryan

Sent: Wednesday, October 28, 2015 2:25 PM

To: Davidson, Ken <Davidson.Ken@epa.gov>; Shouse, Kate <Shouse.Kate@epa.gov>; Jantarasami, Lesley <Jantarasami.Lesley@epa.gov>; Sarofim, Marcus <Sarofim.Marcus@epa.gov>

Cc: Samulski, Michael <samulski.michael@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Macroff, Bruce <Macroff.Bruce@epa.gov>

Subject: Summary of issues with FAA/MIT cost-benefit analysis (ICAO aircraft CO2 standard) - PLEASE REVIEW

Hello,

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

OVERALL DISCLAIMER:

“The analysis contained within this paper does not reflect current conclusions or prejudice the methodology or results of any future analysis by any department or agency of the United States regarding the impacts of GHG emissions. Any such future analyses, including any regulatory impact analyses conducted to support federal regulatory actions, may differ from the analysis presented in this information paper.”

Thank you,

Bryan

Bryan Manning

U.S. EPA Office of Transportation and Air Quality

Large Marine and Aviation Center

2000 Traverwood Drive

Ann Arbor, MI 48105

(ph) 734-214-4832 (fax) 734-214-4816

manning.bryan@epa.gov

To: Manning, Bryan[manning.bryan@epa.gov];
Laszlo.Windhoffer@faa.gov[Laszlo.Windhoffer@faa.gov]
Cc: Jantarasami, Lesley[Jantarasami.Lesley@epa.gov]; Sarofim,
Marcus[Sarofim.Marcus@epa.gov]; Davidson, Ken[Davidson.Ken@epa.gov]; Shouse,
Kate[Shouse.Kate@epa.gov]; Samulski, Michael[samulski.michael@epa.gov]; Yen,
David[Yen.David@epa.gov]; Leggett, Cullen[Leggett.Cullen@epa.gov]; Maeroff,
Bruce[Maeroff.Bruce@epa.gov]; Audette, Lucie[audette.lucie@epa.gov];
maryalice.locke@faa.gov[maryalice.locke@faa.gov]; James.Hileman@faa.gov[James.Hileman@faa.gov]
From: Ralph.lovinelli@faa.gov
Sent: Wed 10/28/2015 3:55:03 PM
Subject: RE: Follow-up to cost-benefit analysis call

Bryan et al,

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

i Hasselmann, K., S. Hasselmann, R. Giering, V. Ocana and H. V. Storch, "Sensitivity Study of Optimal CO₂ Emission Paths Using a Simplified Structural Integrated Assessment Model (SIAM)," Climatic Change, vol. 37, pp. 345 - 386, 1997.

ii Sausen, R., and U. Schumann, "Estimates of the Climate Response to Aircraft CO₂ and NO_x Emissions Scenarios," Climatic Change, vol. 44, pp. 27-58, Jan 2000.

iii Fuglestad, J.S., T. Berntsen, O. Godal, R. Sausen, K. P. Shine and T. Skodvin, "Metrics of Climate Change: Assessing Radiative Forcing and Emission Indices," Climatic Change, vol. 58, pp. 267 - 331, Jun 2003.

iv Shine, K. P., J. S. Fuglestad, K. Hailemariam and N. Stuber, "Alternatives to the Global Warming Potential for Comparing Climate Impacts of Emissions of Greenhouse Gases," Climatic Change, vol. 68, pp. 281 - 302, Feb 2005.

v Mahashabde, A, P Wolfe, A Ashok, Q He, A Fan, S Lukachko, A Mozdzanowska, C Wollersheim, SRH Barrett, M Locke, IA Waitz (2011). Assessing the environmental impacts of aircraft noise and emissions. Progress in Aerospace Sciences. 47(1):15 - 52.

vi Marais, K., S. P. Lukachko, M. Jun, A. Mahashabde, and I. A. Waitz, "Assessing the impact of aviation on climate," Meteorologische Zeitschrift, vol. 17, pp. 157-172, 2008.

vii Jun M., and A. Mahashabde, "APMT Assessment Report: Benefits Valuation Block – Climate Module," 2008.

viii Wolfe, PJ. Aviation Environmental Policy and Issues of Timescale. Diss. Massachusetts Institute of Technology, 2015.

ix Wolfe, PJ, SD Jacob, SRH Barrett. "APMT-Impacts Climate Code Version 23 Algorithm Design Document," Federal Aviation Administration 2015.

From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Tuesday, October 20, 2015 4:27 PM
To: Iovinelli, Ralph (FAA); Windhoffer, Laszlo (FAA)
Cc: Jantarasami, Lesley; Sarofim, Marcus; Davidson, Ken; Shouse, Kate; Samulski, Michael; Yen, David; Leggett, Cullen; Maeroff, Bruce; Audette, Lucie; Locke, Maryalice (FAA)
Subject: Follow-up to cost-benefit analysis call

Hello Laszlo and Ralph,

Ex. 5 - Deliberative Process

Of course, feel free to forward this information to MIT folks. Let us know if you have any questions.

Thanks again,

Bryan

Ex. 6 - Personal Privacy

-
- [i] Hasselmann, K., S. Hasselmann, R. Giering, V. Ocana and H. V. Storch, "Sensitivity Study of Optimal CO₂ Emission Paths Using a Simplified Structural Integrated Assessment Model (SIAM)," Climatic Change, vol. 37, pp. 345 - 386, 1997.
- [ii] Sausen, R., and U. Schumann, "Estimates of the Climate Response to Aircraft CO₂ and NO_x Emissions Scenarios," Climatic Change, vol. 44, pp. 27-58, Jan 2000.
- [iii] Fuglestedt, J.S., T. Berntsen, O. Godal, R. Sausen, K. P. Shine and T. Skodvin, "Metrics of Climate Change: Assessing Radiative Forcing and Emission Indices," Climatic Change, vol. 58, pp. 267 - 331, Jun 2003.
- [iv] Shine, K. P., J. S. Fuglestedt, K. Hailemariam and N. Stuber, "Alternatives to the Global Warming Potential for Comparing Climate Impacts of Emissions of Greenhouse Gases," Climatic Change, vol. 68, pp. 281 - 302, Feb 2005.
- [v] Marais, K., S. P. Lukachko, M. Jun, A. Mahashabde, and I. A. Waitz, "Assessing the impact of aviation on climate," Meteorologische Zeitschrift, vol. 17, pp. 157-172, 2008.
- [vi] Jun M., and A. Mahashabde, "APMT Assessment Report: Benefits Valuation Block – Climate Module," 2008.
- [vii] Wolfe, PJ. Aviation Environmental Policy and Issues of Timescale. Diss. Massachusetts Institute of Technology, 2015.
- [viii] Wolfe, PJ, SD Jacob, SRH Barrett. "APMT-Impacts Climate Code Version 23 Algorithm Design Document," Federal Aviation Administration 2015.

To: Manning, Bryan[manning.bryan@epa.gov]; James.Hileman@faa.gov[James.Hileman@faa.gov]; Laszlo.Windhoffer@faa.gov[Laszlo.Windhoffer@faa.gov]
Cc: Leggett, Cullen[Leggett.Cullen@epa.gov]; Yen, David[Yen.David@epa.gov]; Maeroff, Bruce[Maeroff.Bruce@epa.gov]
From: Ralph.lovinelli@faa.gov
Sent: Wed 8/5/2015 8:05:23 PM
Subject: RE: Setup slides on co2 std for redac
20150804 Windhoffer - CO2 Standard - v0.3.pptx

Here are the final slides I will speak to tomorrow....

-----Original Message-----

From: lovinelli, Ralph (FAA)
Sent: Wednesday, August 05, 2015 3:57 PM
To: 'Manning, Bryan'; Hileman, James (FAA); Windhoffer, Laszlo (FAA)
Cc: Leggett, Cullen; Yen, David; Maeroff, Bruce
Subject: RE: Setup slides on co2 std for redac

Thanks for the comments, Bryan. We will accept all of your edits and try to do our best tomorrow.

Ralph

-----Original Message-----

From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Wednesday, August 05, 2015 3:30 PM
To: lovinelli, Ralph (FAA); Hileman, James (FAA); Windhoffer, Laszlo (FAA)
Cc: Leggett, Cullen; Yen, David; Maeroff, Bruce
Subject: RE: Setup slides on co2 std for redac

Hello Ralph,

Ex. 5 - Deliberative Process

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816

manning.bryan@epa.gov

-----Original Message-----

From: Ralph.lovinelli@faa.gov [mailto:Ralph.lovinelli@faa.gov]

Sent: Tuesday, August 04, 2015 6:19 PM

To: James.Hileman@faa.gov; Laszlo.Windhoffer@faa.gov

Cc: Manning, Bryan

Subject: RE: Setup slides on co2 std for redac

Ex. 5 - Deliberative Process

Ralph

-----Original Message-----

From: Hileman, James (FAA)

Sent: Tuesday, August 04, 2015 10:13 AM

To: Windhoffer, Laszlo (FAA); lovinelli, Ralph (FAA)

Cc: Bryan Manning

Subject: Setup slides on co2 std for redac

Ralph and Laszlo,

Ex. 5 - Deliberative Process

We have a short timeslot for FAA and EPA to discuss this.

Note EPA will be joining via phone.

Please let me know if you have any questions on this.

Thanks,
Jim

Sent from my iPhone

To: Leggett, Cullen[Leggett.Cullen@epa.gov];
Stephen.Arrowsmith@easa.europa.eu[Stephen.Arrowsmith@easa.europa.eu]
From: Laszlo.Windhoffer@faa.gov
Sent: Wed 10/21/2015 3:07:07 PM
Subject: RE: Could you send me the latest version of Annex 16 so I can check the definitions?
151020 Annex 16 Volume III CO2 Standard.docx

Ex. 5 - Deliberative Process

Attached is yesterday's presentation version, we're making edits in a side meeting.

László Windhoffer

*Federal Aviation Administration
T: +1-202-267-4741*

From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: Wednesday, October 21, 2015 11:02 AM
To: Windhoffer, Laszlo (FAA); Stephen.Arrowsmith@easa.europa.eu
Subject: Could you send me the latest version of Annex 16 so I can check the definitions?